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(54) SOFT FIBROUS WEB AND PRODUCTION THEREOF

(57)Abstract:

PURPOSE: To obtain a soft tissue paper highly safe to the skin, excellent in skin touch, esp. dampish feel, also producing little paper powder, thus suitable for pollinosis or rhinitis.

CONSTITUTION: This soft fibrous web, a tissue paper, is obtained by t impregnating a tissue paper material 10-55g/m2 in basis weight under the standard conditions of 20°C and 65% RH with 1-130wt.% of a medicinal liquid consisting mainly of 5-20-wt.% of liquid paraffin, 50-85wt.% of a polyhydric alcohol, 3-30wt.% of a saccharide and ≤5wt.% of a nonionic surfactant.

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CLAIMS

[Claim(s)]
[Claim 1] The fiber web which has the flexibility to which the medical fluid which makes a base resin 5 - 20% of liquid paraffins, and 50 - 85% of polyhydric alcohol and 3 - 30% of saccharides is characterized by sinking in 1 to 130% to the fiber web material of the U.S. tsubo 10 in the temperature of 20 degrees C, and 65% RH criteria of humidity - 55 g/m2.
[Claim 2] The fiber web which has the flexibility according to claim 1 which contains the nonionic surface active agent 5% or less further in the aforementioned medical fluid.
[Claim 3] The fiber web according to claim 1 which polyhydric alcohol becomes from a glycerol, propylene glycols, or those mixture.
[Claim 4] The fiber web according to claim 1 which a saccharide becomes from a sorbitol, glucoses, or those mixture.
[Claim 5] The fiber web according to claim 2 which a nonionic surface active agent becomes from a glycerol ester, fatty acid ester, or those mixture.
[Claim 6] The manufacture method of a fiber web of having the flexibility characterized by making it sinking in 1 to 130% with the decalcomania method which takes up and applies the medical fluid which gives the humid feeling which plotted the impression cylinder and held the U.S. tsubos 10-55g/the fiber web material of m2 in the temperature of 20 degrees C, and 65% RH criteria of humidity in the bat to this fiber web material.
[Claim 7] The manufacture method of a fiber web of having the flexibility according to claim 6 whose aforementioned decalcomania method is a flexo decalcomania method.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] The safety of this invention to the skin is high, and it is flexible, and it excels in admiration gently especially, and is related with the touch, the fiber web which has the flexibility which there is little generating of paper powder and contains the suitable lotion for pollinosis or a rhinitis use, and its manufacture method.
[0002] As a fiber web in this invention, although a nonwoven fabric is also included, they are a cellulosic fiber web, especially tissue paper preferably.
[0003]
[Description of the Prior Art] As for home papers, such as tissue paper and toilet paper, the consumption is increasing in respect of the simple nature of a life, or the amenity. In this case, as compared with toilet paper, water resistance is needed and, as for the tissue paper which can be set, intensity is needed.
[0004] Furthermore, using a softening agent from the former for raising the flexibility of tissue paper and making it software-ize a feel is known. As this softening agent, the thing of a surfactant, a wax emulsion, a reaction type softening agent (what it reacts [what] firmly with a cellulose and carries out orientation of the aliphatic hydrocarbon to the circumference of fiber regularly), and a silicone system etc. is known.
[0005] However, since this kind of softening agent is a chemosynthesis article, it cannot

necessarily be said to the sensitive skin that it is suitable. Moreover, the inclination which paper powder tends to generate is caused conversely, and there is a problem of absorptivity falling just because it expects the manifestation of flexibility.
[0006] Then, it sets to JP,5-156596,A (it is called the example of the 1st precedence). The salts which have hygroscopicity (a sodium chloride, a calcium chloride, a potassium pyrophosphate, sodium metaphosphate, a polyphosphoric acid potassium, sodium polyphosphate), The polyhydric alcohol and the saccharide (the glycerol, the D sorbite, the maltitol, the reduction maltose starch syrup, reduction amylolysis object) which have hygroscopicity, the thickening agent (a sodium alginate and sodium polyacrylate --) which has water retention A methyl cellulose, propylene glycol alginate, a carboxy methyl cellulose (CMC), It is indicating infiltrating a calcium carboxymethyl cellulose, sodium carboxymethyl starch, starch phosphoric ester sodium, casein, and the medical fluid containing a casein sodium into a nonwoven fabric or paper.
[0007] In this case, each thickening agent which has the salts which can be set, and which have hygroscopicity, polyhydric alcohol and a saccharide, and water retention supposes that it is what makes the operation which gives hygroscopicity, flexibility, touch nature, etc. or makes it improve. Moreover, it is supposed that it will be based on a spray method as a means to sink in a medical fluid.
[0008] The constituent for cleansing cream tissue which a makeup and the skin became dirty in JP,2-104511,A (it is called the example of the 2nd precedence), and, on the other hand, blended a polyalkylene glycol, ethanol, water-soluble polyhydric alcohol, a surfactant, and water with it for the chute is indicated.
[0009]
[Problem(s) to be Solved by the Invention] However, inorganic substances, such as a calcium chloride, are added, and smoothness falls, and the example of the 1st precedence is not enough as admiration (humid feeling) and flexibility gently just because it requires hygroscopicity, although excelled about the safety to the skin of a human body.
[0010] On the other hand, the thing of the example of the 2nd precedence does not use water as the base, it puts it into the hermetically sealed enclosure beforehand so that it may not volatilize, and it is a thing of the type picked out from the container the whole sheet. Therefore, although it is suitable for the makeup, it is not suitable for the use which blows a nose for men, such as rhinitis.
[0011] On the other hand, since the example of the 2nd precedence is a humid type thing, although it is unrelated and a medical fluid is applied with a spray in the example of the 1st precedence, the coverage in per unit area varies and there is a fundamental problem.
[0012] Therefore, the 1st technical problem of this invention is high, and flexible, it excels in admiration gently, and especially, there is little generating of paper powder and the safety to the skin is to offer [the touch and] fiber webs, such as pollinosis and suitable dry-sand-mould (that is, for it not to be necessary to contain in hermetically sealed enclosure) tissue paper for a rhinitis use.
[0013] The 2nd technical problem is to offer the manufacture method of the fiber web which can apply a medical fluid uniformly to a fiber web material.
[0014]
[Means for Solving the Problem] The medical fluid which makes a base resin 5 - 20% of liquid paraffins, and 50 - 85% of polyhydric alcohol and 3 - 30% of saccharides can solve the above-mentioned technical problem by sinking in 1 to 130% to the U.S. tsubos 10-

55g/the fiber web material of m2 in the temperature of 20 degrees C, and 65% RH criteria of humidity.
[0015] In this case, a nonionic surface active agent can be made to contain 5% or less further in the aforementioned medical fluid.
[0016] Polyhydric alcohol is chosen from a glycerol, propylene glycols, or those mixture, a saccharide is chosen from a sorbitol, glucoses, or those mixture, and a nonionic surface active agent can be chosen from a glycerol ester, fatty acid ester, or those mixture.
[0017] Moreover, this fiber web can be obtained by making it sink in 1 to 130% especially with a flexo decalcomania method with the decalcomania method which takes up and applies the medical fluid which gives the humid feeling which plotted the impression cylinder and held the fiber web material of the U.S. tsubo 10 in the temperature of 20 degrees C, and 65% RH criteria of humidity - 55 g/m2 in the bat to this fiber web material.
[0018]
[Function] In this invention, unlike the water base type thing of the example of the 2nd precedence, like usual tissue paper, it holds in a carton, takes out the whole sheet, and use is presented.
[0019] However, in this invention, 5 - 20%, 50 - 85% of polyhydric alcohol and 3 - 30% of saccharides, and the medical fluid that will make a base resin 5% or less of nonionic surface active agent if still more nearly required are used. It is not necessarily clear in whether the "it is admiration gently" (humid feeling) property which these or both components are related and this invention makes the main purpose is shown.
[0020] It can take and a liquid paraffin is used in 5 - 20% of range in that and this invention. Admiration falls gently that the addition of a liquid paraffin is less than 5%, and smoothness falls, and it is rough. Conversely, if it exceeds 20%, while it will be sticky and giving admiration (feeling of stickiness), it is rough and comes to give stiff sensibility further. The more suitable range is 8 - 15%. since the removal property of the oil content of the skin is suppressed by mixing a liquid paraffin at this invention, without making excessive the removal property of the oil content of the skin by polyhydric alcohol like the example of the 2nd precedence, a forge fire is good -- admiration can be obtained gently
[0021] The addition of polyhydric alcohol is made into 50 - 85%. At less than 50%, admiration is inferior gently with the toilet effect. If it exceeds 85%, the addition of other components will decrease and the balance of the whole property will become bad. Moreover, while strong degradation taking place and becoming easy to be torn, it comes to give the sticky sensibility. Especially as polyhydric alcohol, it is desirable to consist of a glycerol, propylene glycols, or those mixture.
[0022] The addition of a saccharide is made into 3 - 30%. If admiration and softness fall gently and it exceeds 30%, the balance of the whole property will become bad, on-the-strength degradation will take place, and it will become easy to be torn by less than 3%. Especially as a saccharide, what consists of a sorbitol, glucoses, or those mixture is suitable.
[0023] If still more nearly required, 5% or less of nonionic surface active agent can be added. As a nonionic active agent, a sorbitan fatty acid ester, diethylene-glycol monostearate, Diethylene-glycol monooleate, glyceryl monostearate, Polyhydric-alcohol monochrome fatty acid ester, such as glyceryl monochrome olate and propylene-glycol

monostearate, N-(3- me yloxy-2-hydroxypropyl) diethanolamine, Polyoxyethylene hydrogenated castor oil, polyoxyethylene sorbitol beeswax, Polyoxyethylene sorbitan sesquistearate, polyoxyethylene monooleate, Polyoxyethylene sorbitan sesquistearate, polyoxyethylene glyceryl monochrome olate, Polyoxyethylene monostearate, polyoxyethylene monochrome laurate, polyoxyethylene monooleate, the polyoxyethylene cetyl ether, the polyoxyethylene lauryl ether, etc. can be mentioned.

[0024] Secondary additives, such as an anionic surfactant, perfume, a colorant, antiseptics, and an antioxidant, can be added at 1% or less of a rate to these medical fluids.

[0025] The aforementioned medical fluid is infiltrated to a tissue paper material. As a target tissue paper material, it considers as the U.S. tsubo 10 in the temperature of 20 degrees C, and 65% RH criteria of humidity - 55 g/m2. It is 10 - 20 g/m2 more preferably. The U.S. basis weight of chewiness is lost with a low, and problems, such as producing fracture, are produced. Conversely, it will be bad inflexible if the U.S. basis weight is too high.

[0026] Although this tissue paper material can be manufactured by the conventional method, it consists of pulp 100% preferably. In this case, if NBKP:LBKP carries out comparatively, 50:50-100:0, especially 85:15-93:7 are desirable. Soft feel nature can be obtained, so that the rate of NBKP is high. Of course, crepe processing is performed after wet paper milling. Especially as a rate of a crepe in this case, 17 - 23% is desirable 15 to 25%.

[0027] The aforementioned medical fluid sinks in 1 to 130% to a tissue paper material. Especially a suitable sinking-in rate is 15 - 25%. If many [if there are few sinking-in rates, admiration is not enough gently, and / conversely / too], gently, admiration will come out enough and the soft feel nature of a certain thing will stop being able to obtain it easily.

[0028] Although a spray application is possible as a mode of sinking in as given [concerning the example of the 1st precedence] in an official report Since a part for a core has many coverages of the medical fluid from each spray nozzle 2 and 2 -- and the amount of periphery decreases to the tissue paper material 1 as shown in drawing 1 Though a lap is carried out, control of the lap portion is difficult, in a lap portion, Siwa occurs and overall dispersion of a coverage cannot be avoided fundamentally.

[0029] It is desirable to adopt a flexo decalcomania method especially with the decalcomania method which takes up and applies the medical fluid 5 which gives the humid feeling which plotted the impression cylinder 3 and held the tissue paper material 1 in the bat 4 to this tissue paper material 1 at this point.

[0030] Drawing 2 is what showed the gravure decalcomania method, and after it transfers a medical fluid to anilox roll (engraved roll) 6 and attains extra jacket ******** with a doctor blade 7, it can be applied to the tissue paper material 1 passing through between impression cylinders 3. However, in order to adjust a coverage in this case, in the amount of extra jackets by the doctor blade 7, it is a minute amount very much, and it is necessary to change into another anilox roll 6 which has a different stamp, and the time of a roll substitute is needed. And it is uneconomical to prepare much anilox roll 6.

[0031] For this reason, the flexo decalcomania method shown in drawing 3 is the optimal. That is, after [which consists of a rubber covered roll or a metal roll] extracting, taking up with a roll 8 and transferring this to anilox roll 6, it is made to shift to the version

drum 9, and this is applied to the tissue paper material 1. By this flexo decalcomania method, a coverage is delicately [easily and] controllable by adjusting the gap of the drawing roll 8 and anilox roll 6. Moreover, control of a coverage is possible also by replacing the version drum 9 with. A change of the version drum 9 can be made quickly and easily.

[0032]

[Example] It is a book by the following example.

(Example 1)

Various medical fluids were applied to NBKP:LBKP=90:10, 20% of rates of a crepe, and the tissue paper material of U.S. tsubo 12.5 g/m2 (temperature of 20 degrees C, 65% RH criteria of humidity). The result is shown in Table 1.

[0033]

[Table 1]

処方 No	薬液配合（%）			
	流動 パラフィン	多価アルコール グリセリン	糖類 ソルビトール	非イオン界面活性剤 グリセリンエステル
1	4	73	20	3
2	8	71	18	3
3	13	68	16	3
4	18	65	14	3
5	22	63	12	3
6	10	86	1	3
7	13	47	37	3
8	13	プロピレングリコール 68	ソルビトール 16	グリセリンエステル 3
9	13	グリセリン 68	グルコール 16	グリセリンエステル 3
10	3	グリセリン 68	ソルビトール 16	脂肪酸エステ 3
11	13	グリセリン 68	ソルビトール 16	なし

[0034] According to this result, it turns out that especially the combination concerning this invention is desirable.
[0035] (Example 2)
12% of combination which was obtained by various kinds of experiments which include example 1 to tissue paper material of NBKP:LBKP from which rate of crepe and U.S. tsubo differ comparatively and which is considered to be the optimal, i.e., liquid paraffin, and glycerol 68%, sorbitol 18%, pulp combination, the rate of a crepe, the U.S. tsubo, and the coverage were changed, and the glycerol-ester 2% medical fluid was applied. The result is shown in Table 2 - 4.
[0036]
[Table 2]

試料 No.	パルプ配合 NBKP LBKP	クレープ率 %	米坪 g/m²	薬液塗布量	しっとり
—	第1先行例の市販品				○
1	70 30	20%	55	150 %	◎
2	〃	〃	〃	100 %	◎
備考	柔らかくなく、強度が低い。塗布量を下げ が低いほど、ウェブは硬くなるために、こ は意味がない。				
3	90 10	20%	55	150 %	◎
備考	NBKPの増配により、柔らかさを高めること 較で、効果がでない。				
4	70 30	20%	25	100 %	◎
5	〃	〃	〃	30 %	○
備考	米坪が低くすると、強度が低下する。塗布量 っとり感が悪くなり、ウェブが硬くなる。				
6	70 30	15%	25	100 %	◎
7	〃	〃	〃	30 %	○
備考	クレープ率を変えても、No. 4および5と				

[0037]
[Table 3]

試料 No.	パルプ配合 NBKP	LBKP	クレープ率 %	米坪 g/m²	薬液塗布量	しっとり
13	70	30	15%	15	100 %	◎
14	〃		〃	〃	30 %	◎
15	〃		〃	〃	20 %	◎
備考	クレープ率を下げると柔らかさと滑らかさ					
16	90	10	20%	15	100 %	◎
17	〃		〃	〃	30 %	◎
18	〃		〃	〃	20 %	◎
19	〃		〃	〃	10 %	○
備考	クレープ率20%の条件の下で、NBKPを配合 傾向があらわれた。塗布量を下げることで引 くなり、しっとり感も低下した。					
20	90	10	15%	15	30 %	◎
21	〃		〃	〃	20 %	◎
備考	クレープ率を低くすると、塗布量を下げて 硬くなる。					
22	70	30	20%	15	20 %	◎

[0038]
[Table 4]

試料 No.	パルプ配合 NBKP	パルプ配合 LBKP	クレープ率 %	米坪 g/m²	薬液塗布量	しっとり感	柔らかさ	滑らかさ	強さ
27	90	10	15%	12.5	30 %	◎	◎	○	○
28	〃		〃	〃	20 %	◎	○	○	◎
備考	クレープ率が低いと、滑らかさおよび柔らかさが劣る。								
29	90	10	20%	10	20 %	◎	◎	○	×
30	〃		〃	〃	10 %	○	◎	○	△
31	〃		〃	〃	5 %	△	◎	△	△
32	〃		〃	〃	0.5 %	△	◎	△	○
備考	米坪が低いと、やわからさの点においては優れる。しかし、強度の低下が生じ、破れやすくなる。塗布量が少なくすると耐破断性が高まるものの、しっとり感が低下する。								

表2～表4において、評価は4段階で行った。
◎ … 最適
○ … 比較的良好
△ … 適していない
× … 不適

[0039] According to this result, not only combination of a medical fluid but pulp combination, the rate of a crepe, the U.S. tsubo, and a coverage show that a property changes a lot. The inclination about many of these factors was added to the column of a note.

[0040] Moreover, as optimal specification in the case of being aimed at tissue paper as a fiber web, it turns out that they are U.S. tsubo =11-14 g/m2 and coverage =15-25% NBKP:LBKP=85:15-93:7 and rate =of crepe17-23%.

[0041]

[Effect of the Invention] safety [as opposed to / according to this invention the above passage / the skin] -- high -- flexible -- the touch -- especially -- gently -- admiration -- excelling -- and generating of paper powder -- few -- the suitable dry-sand-mould (that is, it is not necessary to contain in hermetically sealed enclosure) fiber web for pollinosis or a rhinitis use -- tissue paper can be offered suitably